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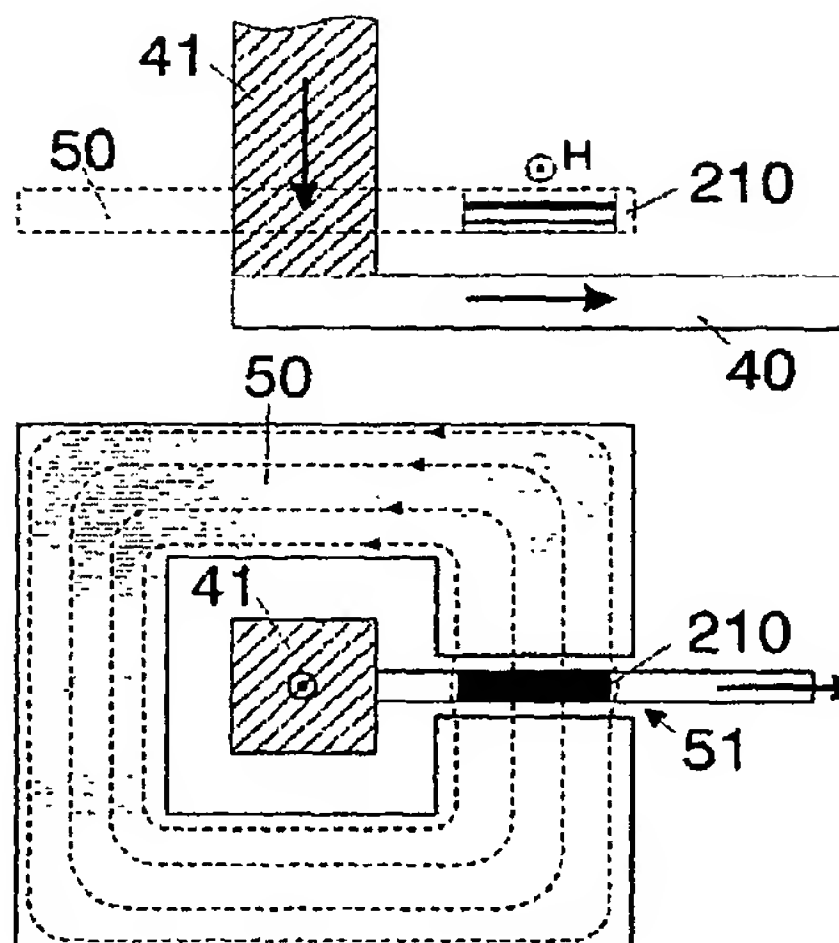
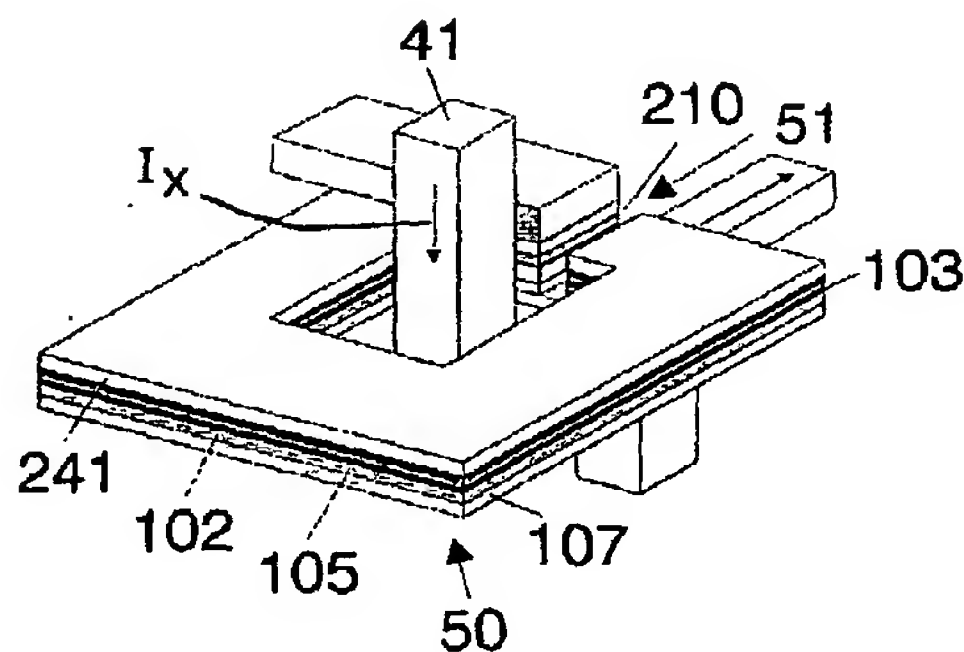
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(54) Title: HIGH SENSITIVITY MAGNETIC BUILT-IN CURRENT SENSOR



(57) Abstract: A sensor for contactlessly detecting currents, has a sensor element having a magnetic tunnel junction (MTJ), and detection circuitry, the sensor element having a resistance which varies with the magnetic field, and the detection circuitry is arranged to detect a tunnel current flowing through the tunnel junction. The sensor element may share an MTJ stack with memory elements. Also it can provide easy integration with next generation CMOS processes, including MRAM technology, be more compact, and use less power. Solutions for increasing sensitivity of the sensor, such as providing a flux concentrator, and for generating higher magnetic fields with a same current, such as forming L-shaped conductor elements, are given. The greater sensitivity enables less post processing to be used, to save power for applications such as mobile devices. Applications include current sensors, built-in current sensors, and IDDQ and IDDT testing, even for next generation CMOS processes.

WO 2005/064356 A3



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